

# Operator's Manual

## **Invacare<sup>®</sup> Pneumatic Oxygen Conservers IOCI00P**



Dealer: This manual MUST be given to the end user.

User: Before using this product, read this manual and save for future reference.

**For more information regarding  
Invacare products, parts, and services,  
please visit [www.invacare.com](http://www.invacare.com)**



*Yes, you can.<sup>®</sup>*

## WARNING

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### **WARNING**

**DO NOT** use this product or any available optional equipment without first completely reading and understanding these instructions and any additional instructional material such as owner's manuals, service manuals or instruction sheets supplied with this product or optional equipment. If you are unable to understand the warnings, cautions or instructions, contact a healthcare professional, dealer or technical personnel before attempting to use this equipment - otherwise, injury or damage may occur.

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### **ACCESSORIES WARNING**

Invacare products are specifically designed and manufactured for use in conjunction with Invacare accessories. Accessories designed by other manufacturers have not been tested by Invacare and are not recommended for use with Invacare products.

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### **NOTICE**

The information contained in this document is subject to change without notice.

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*NOTE: Updated versions of this manual are available on [www.invacare.com](http://www.invacare.com).*

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## **REGISTER YOUR PRODUCT**

The benefits of registering include:

1. Safeguarding your investment.
2. Ensuring long-term maintenance and servicing of your product.
3. Receiving updates with product information, maintenance tips and industry news.

**Register ONLINE at [warranty.invacare.com](http://warranty.invacare.com)**

Please have your model number and purchase date available to complete your registration.

Any registration information you submit will only be used by Invacare Corporation and protected as required by applicable laws and regulations.

## SPECIAL NOTES

Signal words are used in this manual and apply to hazards or unsafe practices which could result in personal injury or property damage. Refer to the following table for definitions of the signal words.

SIGNAL WORD	MEANING
DANGER	Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Caution indicates a potentially hazardous situation which, if not avoided, may result in property damage or minor injury or both.

### Receiving Inspection

Remove product from package and inspect for damage. If there is any damage, DO NOT use. Contact your dealer/ Home Care equipment provider.

### Intended Use

The oxygen conserving regulator is intended for prescription use only, to be used as part of a portable oxygen delivery system for patients that require supplemental oxygen in their home and for ambulatory use.

## **Disposal Instructions**

This device and its packaging contain no hazardous materials. No special precautions need to be taken when disposing the device and/or it's packaging.

## **Principles of Operation**

The oxygen conserving regulator is designed to be used with high pressure oxygen systems. It consists of a cylinder connection, cylinder contents gauge (if equipped), high to low pressure regulator, orifice plate and a conserving demand module. The regulator reduces the high pressure of the cylinder to the working pressure of the orifice plate. The orifice plate uses calibrated orifices to deliver a selected flow to the conserving demand module. The conserving demand module controls the pulse size and timing to the patient. It supplies a pulse of oxygen at the beginning of each breath. This reduces the oxygen demand on the system and limits the drying of the airways. The flow is determined by setting the flow control knob to the prescribed flow. The oxygen is supplied to the patient though the cannula.

** DANGER**

DO NOT SMOKE while using this device. Keep all matches, lit cigarettes or other sources of ignition out of the room in which this product is located and away from where oxygen is being delivered.

NO SMOKING signs should be prominently displayed. Textiles and other materials that normally would not burn are easily ignited and burn with great intensity in oxygen enriched air. Failure to observe this warning can result in severe fire, property damage and cause physical injury or death.

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# INTRODUCTION

The oxygen conserving regulator includes a combination of low-pressure regulator and an oxygen conserver, designed for use with a cylinder as an ambulatory oxygen system. It is capable of delivering a precise amount of supplemental oxygen at the optimal point in the breathing cycle. The conserver greatly increases the efficiency in the delivery of oxygen, maximizing the beneficial effects and eliminating unnecessary oxygen waste.

When we breathe, approximately one-third of the time is spent inhaling and two-thirds exhaling. As a result, oxygen delivered by continuous flow is wasted during exhalation. By eliminating oxygen flow during exhalation, a two-thirds savings is possible. Additionally, the oxygen available during the very first part of inhalation contributes mostly to meet oxygen needs. The oxygen conserving regulator takes advantage of these facts to provide maximum efficiency in the delivery of oxygen. This device is designed to be an integral component of a lightweight, long-lasting ambulatory oxygen system.



## **SECTION I—GENERAL GUIDELINES**

When using the oxygen conserving regulator, basic precautions should ALWAYS be followed, including the following:

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### **⚠ WARNING**

SECTION 1 - GENERAL GUIDELINES contains important information for the safe operation and use of this product.

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## **Operating Information**

“Caution: Federal law restricts this device to sale by or on the order of a physician or any other practitioner licensed by the law of the state in which he/she practices to use or order the use of this device.”

This product is not intended as a life-sustaining or life-supporting device.

Only personnel instructed and trained in the use of the oxygen conserving regulators/cylinders should operate this product.

Product contains magnetic, ferrous material that may affect the results of an MRI.

Be sure all connections are tight and leak free.

DO NOT use a liquid leak detector to test for leaks.

DO NOT autoclave.

DO NOT gas sterilize with ethylene oxide.

DO NOT clean with aromatic hydrocarbons.

## **SECTION I—GENERAL GUIDELINES**

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DO NOT attempt to repair product.

DO NOT immerse product in any kind of liquid.

Store product in a clean area when not in use.

NEVER smoke in an area where oxygen is being administered.

NEVER use aerosol sprays near the equipment.

ALWAYS confirm prescribed dose before administering to patient and monitor on a frequent basis.

DO NOT use if dirt or contaminants are present on or around cylinder, valve, product or connecting devices.

Not suitable for use in the presence of flammable anesthetic mixture.

NEVER use near any type of flame or flammable/explosive substances, vapors or atmosphere.

ALWAYS follow ANSI and CGA standards for Medical Gas Products and Flowmeters (E-7) and Oxygen Handling (G-4).

NO OXYGEN is delivered when the pointer is aligned with "Off".

DO NOT block the outlet fitting or kink the cannula when the product is in use, this may damage the unit.

The use of this device is limited to the oxygen patient. Cylinders MUST be used only by the oxygen patient and are not to be distributed to any other individual for any purpose.

This product is NOT to be used by patients who breathe through their mouths.

DO NOT use a humidifier with this product.

DO NOT allow cylinders to tip or fall. Secure gas cylinders so they cannot fall. Ensure cylinder is always in upright position.

DO NOT allow oil from your hands or other sources to come into contact with the cylinder post valve. These substances may become flammable in the presence of oxygen and cause injury. Avoid touching the cylinder post valve whenever possible. Example of items to avoid are hand creams or lotions, cooking oils, suntan oils or sun blocks and similar oily products. If you use these types of products, wash your hands prior to use. If the bottle fitting should come in contact with such substances it should be cleaned off with a damp cloth prior to connecting it to the conserving regulator.

NEVER oil or lubricate the oxygen conserving regulator or cylinder post valve. NEVER use any penetrating oil or lubricant such as WD-40® or 3-in-1 oil®. If continued difficulty is experienced contact your supplier for assistance.

DO NOT store cylinders near sources of heat or flame.

DO NOT use while sleeping without consulting your healthcare provider.

This product is designed to operate with a standard single lumen, adult oxygen nasal cannula with a maximum length of seven feet.

The cannula is for single patient use only.

Cannula **MUST** be installed on outlet connection prior to use.

## **SECTION I—GENERAL GUIDELINES**

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DO NOT place the unit under such items as blankets, bed coverings, chair cushions, clothing and away from heated or hot surfaces, including space heaters, stoves and similar electrical appliances. When this product is in use a small amount of oxygen is vented. With regards to clothing - wearing the unit under clothing may saturate fabrics with oxygen and cause them to burn rapidly if exposed to sparks or flame. It may take several hours for oxygen levels in fabrics to return to normal.

## SECTION 2—FEATURES

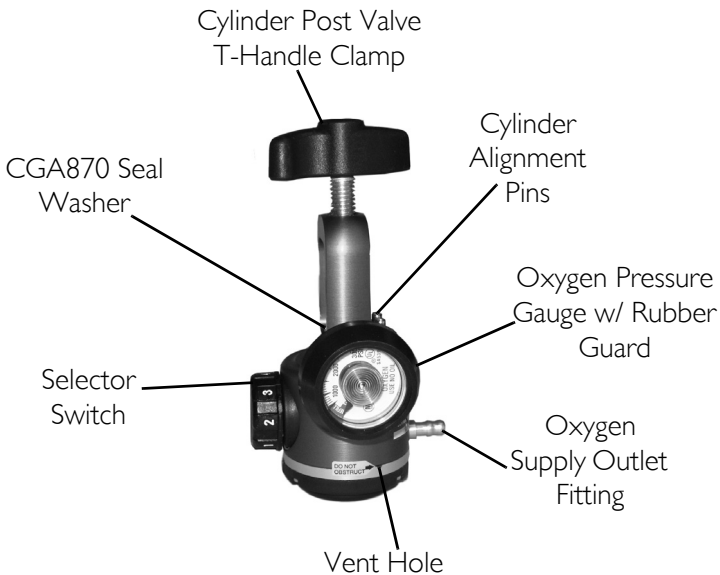
### **⚠ DANGER**

This product is not intended as a life-sustaining or life-supporting device.

### **CAUTION**

Missing or illegible labels **MUST** be replaced. Contact customer service at the number on the back page.

### **Model IOC100P**



**FIGURE 2.1** Model IOC100P

**Cylinder Post Valve T-Handle Clamp:** This is used to attach the unit to any CGA870 post-valve cylinder.

## SECTION 2—FEATURES

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**Oxygen Pressure Gauge:** Enables the user to monitor the contents of the compressed oxygen cylinder and is protected by a rubber guard.

**Selector Switch:** Enables the user to select the desired setting, as well as “OFF” and “CF” (continuous flow). When not in use, the switch should be turned to the “OFF” position.

**Oxygen Supply Outlet:** Use this fitting to attach a standard cannula.

**Cylinder Alignment Pins:** When assembling the unit, these parallel pins **MUST** be inserted into the holes on the CGA870 post valve.

**CGA870 Seal Washer [Metal Washer with Viton or equivalent Seal]:** Creates the interface between the post valve and the conserver regulator. Besides offering a rugged interface, it also surrounds the oxygen path in a ring of stainless steel or brass.

**Vent Hole:** Maintains proper internal pressure. **DO NOT** obstruct with any object, such as a label or tight-fitting carrying bag.

*NOTE: Use only a CGA870 Seal Washer [Metal Washer with Viton Seal]. DO NOT use a plastic compression gasket.*



**FIGURE 2.2** Connection view of the IOCI00P with CGA870 Connection

## SECTION 3—INSTALLING THE CONSERVING REGULATOR

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### **WARNING**

DO NOT allow oil from your hands or other sources to come into contact with the regulator gasket or cylinder post valve. These substances may become flammable in the presence of oxygen and cause injury. Avoid touching the cylinder post valve whenever possible. Example of items to avoid are hand creams or lotions, cooking oils, suntan oils or sun blocks and similar oily products. If you use these types of products, wash your hands prior to use. If the cylinder post valve should come in contact with such substances it should be cleaned off with a damp cloth prior to connecting it to the conserving regulator.

DO NOT direct flow of oxygen at any person or flammable material when opening the cylinder.

DO NOT use without CGA870 Seal Washer [Metal washer with elastomer seal].

DO NOT use plastic yoke seals [Plastic compression gasket].

Use CGA870 Seal Washer made of Viton® and brass.

The CGA870 Seal Washer supplied with the oxygen conserving regulator is reusable.

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### **CAUTION**

DO NOT use tools to tighten T-handle, this can lead to over tightening and will cause damage to the oxygen conserving regulator.

Ensure all connections are tight and leak free.

DO NOT use liquid leak detector to test for leaks.

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## SECTION 3—INSTALLING THE CONSERVING REGULATOR

*NOTE: For information on how to operate the cylinder, consult your equipment provider.*

*NOTE: For this procedure, refer to FIGURE 3.1.*

1. Loosen the cylinder post valve T-Handle.
2. Lower the conserver over any CGA870 post valve cylinder with the alignment pins toward the holes on the cylinder neck.
3. Align the two pins and gasket with the corresponding holes on the cylinder post valve.



**FIGURE 3.1** Attaching the IOC100P to the Cylinder

*NOTE: Cylinder post valve T-Handle should be aligned with indentation on post valve.*

4. While holding the unit in place, tighten the cylinder post valve by turning clockwise.
5. Attach a standard cannula [7 ft. (2.13 m) or less in length] to the oxygen supply outlet fitting.

*NOTE: Tighten only by hand. The use of a tool to tighten the T-Handle may damage the unit.*

## **SECTION 4—OPERATING INSTRUCTIONS**

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### **DANGER**

**NEVER** smoke in an area where oxygen is being administered.

**NEVER** use near any type of flame or flammable/explosive substances, vapors or atmosphere.

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### **CAUTION**

DO NOT use pediatric, low flow nasal cannulas or oxygen masks with the oxygen conserving regulator.

DO NOT block the cannula connection or kink cannula tubing when the oxygen conserving regulator is in use. This may damage the oxygen conserving regulator.

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1. Prior to each use, inspect product for visible damage. DO NOT use if any damage is found.
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### **WARNING**

DO NOT direct flow of oxygen at any person, or flammable material when adjusting the flow dial.

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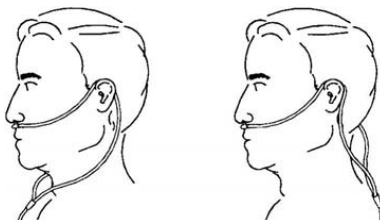
2. Turn the selector switch on the oxygen conserving regulator to the “0” OFF position before opening the cylinder valve. FIGURE 4.2 on page 21.
  3. To reduce the risk of rapid oxygen recompression and fire, open the cylinder valve slowly and completely so the pressure gauge moves slowly as it indicates the cylinder pressure.
-

## SECTION 4—OPERATING INSTRUCTIONS

4. Listen for leaks. If a leak is present, close the cylinder valve, check the CGA870 seal washer, and reinstall. If the leak persists, DO NOT use the equipment. Contact your Home Care Provider for repair.
5. Check the oxygen pressure gauge to verify the cylinder pressure.
6. Ensure that the vent hole on the side of the unit is not obstructed.
7. Position the cylinder so the oxygen cylinder valve outlet is pointing away from the user and any other person(s).
8. Attach a standard adult single lumen oxygen nasal cannula, no longer than seven feet to the product's outlet fitting. DO NOT use pediatric, low flow nasal cannulas or oxygen masks with this product.

*NOTE: A unit without cannula attached may pulse if set at position 1-6.*

9. Place the cannula over your ears and position the prongs in your nose according to the cannula manufacturer's instructions, or as instructed by your Health Care provider. Refer to FIGURE 4.1.



**FIGURE 4.1** Cannula Placement

### **WARNING**

NO OXYGEN is delivered in between settings. To obtain desired flow, the indicating pointer **MUST** align with a specific number on the dial.

To avoid injury to patient, **ALWAYS** confirm prescribed setting before administering to patient and monitor flow on a frequent basis.

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10. Turn the selector switch until indicating pointer is aligned with the prescribed setting. FIGURE 4.2 on page 21.

*NOTE: The continuous flow setting (CF) is designed for emergency use only. The amount of oxygen delivered when using the oxygen conserving regulator in continuous flow mode is preset to 2 L/min. (liters per minute). Remember that in this mode the oxygen will be consumed at a much faster rate. Return to another source before running out of oxygen. FIGURE 4.2 on page 21.*

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### **WARNING**

When pointer on contents gauge enters red zone, it is recommended to replace or refill the cylinder.

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11. Breathe through the nose and feel a pulse of oxygen as you inhale.

*NOTE: When on a pulse setting, there is flow or a pulse only at the beginning of each breath. If you do not feel the pulse at the beginning of each breath, check the setting. If there is still no pulse, turn dial to 2 L/min. continuous setting. FIGURE 4.2 on page 21.*

*NOTE: Because each patient's breathing pattern is different and the environment varies, it may be difficult to feel some low setting pulses.*

## SECTION 4—OPERATING INSTRUCTIONS

12. When finished using the system, close the oxygen supply cylinder valve and continue breathing through the nasal cannula until no further oxygen flow is detected.
13. Remove the nasal cannula and turn the selector switch to the “0” OFF position.
14. When not in use, store in a clean, dry location.

Continuous  
Flow Setting  
(CF)



Selector Switch

**FIGURE 4.2** Selector Switch

## **SECTION 5—REMOVING THE CONSERVING REGULATOR**

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### **⚠ DANGER**

**NEVER** attempt to remove the oxygen conserving regulator from an oxygen cylinder unless the cylinder valve is completely closed.

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### **CAUTION**

DO NOT try to loosen the T-handle beyond the stop. Otherwise, damage to the oxygen conserving regulator will occur.

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*NOTE: For information on how to operate the cylinder, consult your equipment provider.*

1. Completely close the oxygen cylinder valve.
2. Turn the oxygen conserving regulator selector switch to 2 L/min. continuous flow position.
3. Wait for oxygen to stop flowing from the oxygen conserving regulator.
4. Turn the T-handle to loosen the connection to the post valve.
5. Remove the oxygen conserving regulator from the post valve.

# SECTION 6—TYPICAL PRODUCT PARAMETERS

OXYGEN DELIVERY:	SELECTOR SWITCH POSITION	LITER FLOW EQUIVALENCY
	0	OFF
	1	1
	2	2
	3	3
	4	4
	5	5
	6	6
<b>CONTINUOUS FLOW EMERGENCY BYPASS SETTING:</b>	Factory Preset at $2 \pm .5$ L/min.	
<b>REQUIRED OPERATING PRESSURE:</b>	200 psi to 3000 psi (13.8 bar to 206.8 bar)	
<b>REGULATOR:</b>	Built-in, $25 \pm 5$ psi (1.7 bar $\pm$ .34 bar), brass high pressure with aluminum low pressure materials	
<b>DIMENSIONS:</b>		
Weight	Approximately 14.8 ounces (420 grams)	
Overall Length	Approximately 5" L (12.7 cm) x 2.5" H (6.4 cm) x 2.5" W (6.4 cm)	
<b>OPERATING CONDITIONS TEMPERATURE:</b>	$32^{\circ}\text{F}$ ( $0^{\circ}\text{C}$ ) to $122^{\circ}\text{F}$ ( $50^{\circ}\text{C}$ )	
<b>OPERATING RELATIVE HUMIDITY:</b>	15% to 95%	
<b>OPERATING ALTITUDE:</b>	0 to 10,000 feet (0 to 3,048 meters)	

## SECTION 6—TYPICAL PRODUCT PARAMETERS

<b>STORAGE/ TRANSPORTATION:</b>	Maximum -40°F (-40°C), 1% RH Maximum 145°F (63°C), 44% RH
<b>SHOCK VIBRATION:</b>	Not to exceed IEC 601-1 requirements Not to exceed IEC 68-2-6, IEC 68-2-34
	No smoking or open flames
	Consult accompanying documents



## Oxygen Cylinder Duration

The total delivery of oxygen via the conserver is related to the breathing rates, it is user adaptive in that the total oxygen delivered per minute will automatically adjust with user need, as expressed by increased or decreased breathing rates. For example, at all settings, twice as much oxygen per minute will be delivered if one breathes twenty (20) times per minute as compared with ten (10) times per minute. Refer to OXYGEN DURATION TABLE on page 25.

**OXYGEN DURATION TABLE**

	SETTING	1	2	3	4	5	6	Continuous Flow 2 L/min.
Cylinder Type	Cylinder Volume Liters @ 2015 psi	Estimated Cylinder Duration in Hours (Based on 20 breaths/min.)						
M2	36	1.9	.9	.6	.5	.4	.3	.3
M4(A)	113	5.9	2.9	2.0	1.5	1.2	1.0	.9
M6(B)	164	8.5	4.3	2.8	2.1	1.7	1.4	1.4
ML6	171	8.9	4.5	3.0	2.2	1.8	1.5	1.4
M9(C)	246	12.8	6.4	4.3	3.2	2.6	2.1	2.1
D	425	22.1	11.1	7.4	5.5	4.4	3.7	3.5
E	680	35.4	17.7	11.8	8.9	7.1	5.9	5.7

## **SECTION 7—MAINTENANCE**

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### **CAUTION**

DO NOT use cleaning solutions.

DO NOT immerse product in any kind of liquid.

All repairs **MUST** be done by Invacare Corporation.

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1. Disconnect all connections before cleaning.
2. After each use, clean exterior of the product with a clean, lint-free cloth.
3. Store product in a clean area free from grease, oil, and other sources of contamination.

## SECTION 8—TROUBLESHOOTING

If oxygen conserving regulator fails to function, consult the Troubleshooting guide. If problem cannot be corrected, consult your Dealer/Home Care equipment provider.

PROBLEM	POSSIBLE CAUSE	SOLUTION
No flow. Unit does not pulse.	<ol style="list-style-type: none"> <li>1. Cylinder valve is closed.</li> <li>2. Regulator in "Off" position.</li> <li>3. Cylinder empty.</li> <li>4. Oxygen conserving regulator not sensing breath.</li> <li>5. Oxygen cannula is blocked or kinked.</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn the cylinder valve to the "ON" position.</li> <li>2. Set to prescribed setting.</li> <li>3. Replace cylinder.</li> <li>4. Check position of cannula in nose. DO NOT breathe through mouth.</li> <li>5. Remove kinks. Clean or replace, if necessary.</li> </ol>
Unit flows or pulses continuously.	<ol style="list-style-type: none"> <li>1. Unit is set to the "CF" position.</li> <li>2. Unit was not set to "OFF" prior to opening the cylinder valve.</li> <li>3. Vent hole is obstructed.</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn the selector switch to the appropriate delivery setting.</li> <li>2. Turn the selector switch to "OFF," wait a few moments, then set at proper delivery setting.</li> <li>3. Remove obstructions, such as labels or carrying bag, and resume use as usual.</li> </ol>

### Replacement Parts - Accessories

HF2POST6BAG Carrying Bag or HF2POST9BAG Carrying Bag

# NOTES

# NOTES

## LIMITED WARRANTY

**PLEASE NOTE: THE WARRANTY BELOW HAS BEEN DRAFTED TO COMPLY WITH FEDERAL LAW APPLICABLE TO PRODUCTS MANUFACTURED AFTER JULY 4, 1975.**

This warranty is extended only to the original purchaser/user of our products.

This warranty gives you specific legal rights and you may also have other legal rights which vary from state to state.

Invacare warrants this product to be free from defects in materials and workmanship for a period of two years from date of purchase. If within such warranty period any such product shall be proven to Invacare's satisfaction to be defective, such product shall be repaired or replaced, at Invacare's option. This warranty does not apply to problems arising from normal wear and tear or failure to adhere to these instructions, nor does it include shipping charges incurred in replacement part installation or repair of any such product. Invacare's sole obligation and your exclusive remedy under this warranty shall be limited to such repair and/or replacement.

For warranty service, please contact the Invacare service department during normal business hours at the toll-free telephone number identified on the back cover of this manual.

Upon receiving notice of an alleged defect in a product, Invacare will issue a serialized return authorization. It shall be the responsibility of the purchaser to pack the product(s) or part(s) in an appropriate manner to avoid shipping damage and return the product(s) or part(s), at the purchaser's expense, to either Invacare's plant or service center as specified by Invacare in advance. The defective product(s) or component part(s) must be returned for warranty inspection using the serial number as identification within 30 days of the return authorization date. **DO NOT** return any product(s) or part(s) to our factory or service center without prior consent. **C.O.D.** shipments will be refused – please pre-pay shipping charges.

**LIMITATIONS AND EXCLUSIONS: THE FOREGOING WARRANTY SHALL NOT APPLY TO SERIAL NUMBERED PRODUCTS IF THE SERIAL NUMBER HAS BEEN REMOVED OR DEFACED; PRODUCTS SUBJECTED TO NEGLIGENCE, ACCIDENT, IMPROPER OPERATION, MAINTENANCE, OR STORAGE; PRODUCTS MODIFIED WITHOUT INVACARE'S EXPRESS WRITTEN CONSENT (INCLUDING, BUT NOT LIMITED TO, MODIFICATION THROUGH THE USE OF UNAUTHORIZED PARTS OR ATTACHMENTS); PRODUCTS DAMAGED BY REASON OF REPAIRS MADE TO ANY COMPONENT WITHOUT THE SPECIFIC CONSENT OF INVACARE; PRODUCTS DAMAGED BY CIRCUMSTANCES BEYOND INVACARE'S CONTROL; OR PRODUCTS REPAIRED BY ANYONE OTHER THAN INVACARE OR AN INVACARE SERVICE CENTER. SUCH EVALUATION SHALL BE SOLELY DETERMINED BY INVACARE.**

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**SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGE, OR LIMITATION OF HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE EXCLUSION AND LIMITATION MAY NOT BE APPLICABLE.**

**THIS WARRANTY SHALL BE EXTENDED TO COMPLY WITH STATE/PROVINCIAL LAWS AND REQUIREMENTS.**



***Yes, you can.***

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